

In re Patent Application of:
COFFA ET AL.
Serial No. 10/014,880
Confirmation No. 2364
Filed: DECEMBER 11, 2001

REMARKS

Applicants thank the Examiner for the careful and thorough examination of the present application, and for the indication of allowable subject matter. By this amendment, Claim 18 has been amended to eliminate a minor informality contained therein, and Claims 33-47 directed to the non-elected invention have been canceled. Of course Applicants reserve the right to file one or more related applications directed to the subject matter of the non-elected invention. Claims 9-32 remain pending in the application. Favorable reconsideration is respectfully requested.

I. The Invention

As shown in FIGS. 3-4, for example, the disclosed invention is directed to pressure sensors monolithically integratable together with a semiconductor integrated circuit on the same chip. The monolithically integrated pressure sensors are produced through micromechanical surface structure definition techniques typical of MEMS (MicroElectroMechanical Systems). A microphone cavity in the semiconductor substrate may be monolithically formed by plasma etching the front side or the back side of the silicon wafer to cut a plurality of trenches or holes deep enough to extend for at least part of its thickness into a doped buried layer of opposite type of conductivity of the substrate and of the epitaxial layer grown over it.

II. The Claims are Patentable

Claims 12, 13 and 25 were rejected as allegedly being indefinite for the reasons set forth on page 5 of the Office Action. Applicants point out that the phrase "a sealant layer" in Claims 12,

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13 and 25 meets the antecedent requirements under 35 U.S.C. §112, second paragraph.

Furthermore, Applicants point out that the Examiner's focus during examination of claims for compliance with the requirement for definiteness of 35 U.S.C. §112, second paragraph should be whether the claim meets the threshold requirements of clarity and precision, not whether more suitable language or modes of expression are available. Some latitude in the manner of expression and the aptness of terms should be permitted even though the claim language is not as precise as the Examiner might desire. Examiners should not reject claims or insist on their own preferences if other modes of expression selected by Applicants satisfy the statutory requirement.

As the Examiner is aware, the essential inquiry pertaining to this requirement is whether the claims set out and circumscribe a particular subject matter with a reasonable degree of clarity and particularity. Definiteness of claim language must be analyzed, not in a vacuum, but in light of: (A) The content of the particular application disclosure; (B) The teachings of the prior art; and (C) The claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made. If the scope of the invention sought to be patented can be determined from the language of the claims with a reasonable degree of certainty, a rejection of the claims under 35 U.S.C. §112, second paragraph is not appropriate. Accordingly, Applicants believe that Claims 12, 13 and 25 meet the statutory requirements of 35 U.S.C. §112, second paragraph.

Claims 9-16, 18-27 and 30-32 were rejected in view of Iwata et al. (U.S. 5,665,250) for the reasons set forth on pages 6-

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10 of the Office Action. Applicants contend that Claims 9-16, 18-27 and 30-32 clearly define over the cited reference, and in view of the following remarks, favorable reconsideration of the rejection under 35 U.S.C. §103 is requested.

Independent Claim 9 is directed to a process of fabricating a pressure sensor including forming a buried layer of second conductivity type in a substrate of first conductivity type and forming an upper layer of first conductivity type adjacent the buried layer. At least one opening is formed to a depth sufficient to reach the buried layer, and the buried layer is selectively etched through the at least one opening to make the buried layer porous. A sacrificial layer is formed on the upper layer, and a backplate is formed over the sacrificial layer. The sacrificial layer and porous buried layer are removed to thereby define a cavity and adjacent diaphragm for the pressure sensor. Independent Claim 25 includes substantially similar features.

It is these combinations of features which are not fairly taught or suggested in the cited reference and which patentably define over the cited reference.

The Examiner has relied on the Iwata et al. patent as allegedly disclosing a pressure sensor as set forth in independent Claims 9 and 25. More specifically, the Iwata et al. patent is directed to a surface type acceleration sensor or accelerometer that includes a p-type single crystal silicon base plate, a cantilever and a plurality of strain gauges. The cantilever is disposed in a recess portion formed on the front face of the p-type single crystal silicon base plate so that the cantilever can be displaced in the upward and downward direction in response to an acceleration imparted on the sensor. The cantilever includes an epitaxially grown

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n-type single crystal silicon layer. The strain gauge is made of p-type silicon and formed on an upper face of the base end portion of the cantilever.

Firstly, Applicants maintain that the Examiner has misinterpreted the cited reference. Specifically, Applicants note that the accelerometer of Iwata et al. cannot be considered a pressure sensor at all, much less a pressure sensor as claimed. Indeed, in Iwata et al. a porous Si is removed to form a cantilever that is deformed in response to mass acceleration. In contrast, the claims require removal of a sacrificial layer and buried layer to thereby define a cavity and adjacent diaphragm for a pressure sensor. Nothing in the Iwata et al. device can be considered a diaphragm which is sensitive to pressure, as claimed.

Secondly, Applicants maintain that the Examiner is impermissibly using the teachings of Applicants' own patent application as a roadmap to modify the prior art. For example, as noted above, the method and apparatus of Iwata et al. is not even directed to a pressure sensor. Again, there is no disclosure or teaching of removing a sacrificial layer and buried layer to thereby define a cavity and adjacent diaphragm for a pressure sensor.

As the Examiner is aware, to establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the reference itself or in the knowledge generally available to one of ordinary skill in the art, to modify the reference. Second, there must be a reasonable expectation of success. Finally, the prior art reference must teach or suggest all the claim features. The initial burden is on the Examiner to provide some suggestion of the desirability of doing what the Applicants have done. To support the conclusion that

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the claimed invention is directed to obvious subject matter, either the reference must expressly or impliedly suggest the claimed invention or the Examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the reference. Both the suggestion to make the claimed combination and the reasonable expectation of success must be founded in the prior art and not in Applicants' disclosure.

There is simply no teaching or suggestion in the cited reference to provide the combination of features as claimed. Accordingly, for at least the reasons given above, Applicants maintain that the cited reference does not disclose or fairly suggests the invention as set forth in Claims 9 and 25. Furthermore, no proper modification of the teachings of this reference could result in the invention as claimed. Thus, the rejection under 35 U.S.C. §103(a) should be withdrawn.

It is submitted that the independent claims are patentable over the prior art. In view of the patentability of the independent claims, it is submitted that their dependent claims, which recite yet further distinguishing features are also patentable over the cited references for at least the reasons set forth above. Accordingly, these dependent claims require no further discussion herein.

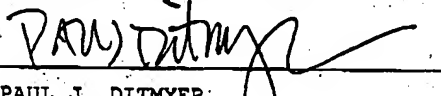
III. Conclusion

In view of the foregoing remarks, it is respectfully submitted that the present application is in condition for allowance. An early notice thereof is earnestly solicited. If, after reviewing this Response, there are any remaining informalities

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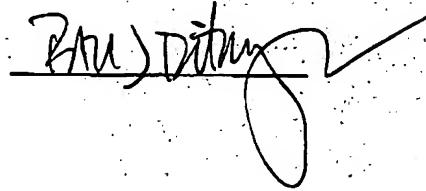
which need to be resolved before the application can be passed to
issue, the Examiner is invited and respectfully requested to contact
the undersigned by telephone.

Respectfully submitted,


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